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ABSTRACT

This study presents forecasts of primary and secondary school enrollment in Bophuthatswana, South Africa up to 1983. Examined are implications of population growth on teachers, classrooms, and general expenditure. Purposes of the study are to estimate (1) future demand for education on the basis of expected enrollment, (2) teacher needs if calculations are based on pupil-teacher ratio, (3) facilities needs, and (4) the budgeted per-pupil expenditure if calculations from past years are projected to future years. The report concludes that the current quantity as well as quality of teacher training for secondary schools is inadequate. Also, if the number of primary teachers who leave the country after training can be limited, the pupil-teacher ratio can be improved. Recommendations are for (1) extending the training of senior secondary teachers, (2) broadening inservice training to include improvement of academic subject knowledge and methodology, (3) establishing a specialized, lower primary training course, and (4) optimum use of already existing training facilities. (Author/LD)

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FORECASTS OF PRIMARY AND SECONDARY SCHOOL ENROLMENT IN BOPHUTHATSWANA, 1979 - 1983 AND THE IMPLICATIONS THEREOF FOR THE PROVISION OF TEACHERS AND CLASSROOMS AND FOR GOVERNMENT EXPENDITURE

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PREFACE

The Research Unit for Education System Planning (RUEP) of the U.O.F.S. is undertaking an extensive research programme on the planning of the educational systems of various developing countries in Southern Africa.

Regarding the educational system of Bophuthatswana research studies have been completed on the present situation, educational needs and an analysis of the educational statistics of 1969-1978.

Of great importance to educational planners are studies of forecasts. This report presents forecasts of the total school population of Bophuthatswana up to 1983. The implications of this population growth are spelt out as far as additional teachers and classrooms, as well as the expected expenditure are concerned.

This report was prepared by Messrs. R.R. Brazelle and I. van Rooyen assisted by Mrs. T. du Pisani. As more information becomes available, further studies will follow and the projections will be refined.

Acknowledgement to the Committee re Development Research and the Department of Education of Bophuthatswana which made this report possible.

D. Vermaak

Head: Research Unit for Education System Planning

November 1978.

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1. INTRODUCTION

Education in developing countries is playing an increasing role in economic, social and political fields. As a result education has claimed a large share of the countries' scarce resources, which reflects the priority which these countries give to education.

The economic constraints facing all developing nations and the associated opportunity costs in terms of alternative resource allocation possibilities, necessitates scientific educational planning and rational decision-making.

Supplying educational facilities in adequate quantity and quality is an objective of all education departments. Amongst other things, it is essential to know whom to make provision for. The responsible planners must therefore make estimates of the expected number of pupils wishing to attend schools in future years.

Only when such information is available, can the implications for the amount of teachers, the number and type of facili= ties needed and the economic implications for the supply of the above be calculated.

In view of the mentioned needs, the outline of the study may be formulated as follows:

- to estimate the future demand for education on the basis of the expected primary and secondary enrolment;

- to estimate what the needs with regard to teachers requirements would be if calculations were based on the pupil-teacher ratio;

- to estimate the needs with respect to physical facilities in the light of the expected pupil enrolment;

- to estimate the budgeted expenditure on education if the budgeted expenditure per pupil of past years is projected to future years.

Forecasts of enrolment do not include students/pupils involved in teacher training and technical and vocational education. The most important reason for their omission is that the number of students/pupils that receive such training is not necessarily statistically calculable. The students/pupils that are involved in such training and the provision of facilities are more dependent on the policy of the educational authorities. The number of students/pupils in this sector of the educational system comprises only a small percentage of the total enrolment so that their omission will have only a nominal effect on the eventual forecasts.

2. METHODOLOGY FOR THE FORECASTS OF ENROLMENT

The forecast of the primary and secondary enrolment of Bophuthatswana is based on the historical trend of enrolment from 1969 to 1978. Two graphs (a linear curve and a parabola) whereof the equations were of the form $y = a + bx$ and $y = a + bx + cx^2$ respectively, were repeatedly adapted to each set of historical data. Enrolment was taken as the dependent variable (y) in the equations. The expected future enrolment was obtained by repeatedly replacing the independent variable (x) with the future year in the equations of both graphs. In other words, two alternative figures were calculated in each case.

Graphs that indicate the historic trend and future expectation with regard to enrolment for each standard, each school phase and for the total school population, were drawn by a computer. These graphs represent the historic trend and the forecast according to the linear curve and parabola - in other words, three graphs were drawn on every axis system.

It was decided to make separate forecasts for all the standards and the different school phases, for a short term period only. This forecast only extends to 1983, because the estimation error increases as the estimation period lengthens. All the forecasts were made with the

assumption that the general historic trend of enrolment will continue for at least the period of the forecast.

The graph that gave the most realistic estimation for each case, was selected. It was done by accepting the alternative that showed the smallest deviation from the actual trend. In some cases, specific factors were responsible for the fact that neither the linear curve nor the parabola fitted. A weighted average was usually calculated to present a value between the two graphs.

This approach has many limitations because it relies on historic trends that will not necessarily continue. By limiting the forecast to the shorter term, educational planners can get some indication of the number of pupils that can be expected in the school system. Such data is important for further estimations and planning.

3. A COMPARISON OF THE FORECASTS FOR 1978 WITH THE ACTUAL ENROLMENT

Forecasts of the primary and secondary school enrolment for Bophuthatswana were made in 1977 (Brazelle, 1978b, pp. 134 - 136). The forecasts for each standard and for the different school phases were based on the enrolment from 1969 - 1977, and the forecasts covered the period 1978 to 1980. A comparison regarding the estimated

figure for 1978 and the actual enrolment for the correspon= ding year therefore seems appropriate.

Generally the actual and estimated figures did not differ substantially. The forecasts for lower primary and higher primary enrolment were 3,89 and 4,04 per cent respectively more than the actual figures for 1978. The actual enrolment for substandard A was 5454 or 8,32 per cent less than the forecast. The only other substantial deviation was experienced in the standard 5 enrolment, where 2680 or 8,83 per cent fewer pupils enrolled than had been forecast. With regard to secondary enrolment the estimate was 8,10 per cent (6298) less than the actual enrolment. This could be attributed mainly to the underestimation of 7309 (or 36,19 per cent) for form III enrolment. The large deviation could be ascribed to the elimination of standard 6 at the end of 1975. It meant that pupils enrolled in standard 5 and standard 6 in 1975 had to be accommodated in form I in 1976. This effected a wave with regard to enrolment which was felt in form II in 1977 and in form III in 1978. Although provision was made in the forecast for 1978, the actual enrolment of 20209 for form III exceeded all expectations.

A tabular comparison of the actual and estimated enrolment in all primary and secondary classes for 1978 is given in Table 1.1.

TABLE 1.1. FORECASTS AND ACTUAL PRIMARY AND SECONDARY ENROLMENT IN BOPHUTHATSWANA FOR 1978

	FORECAST	ACTUAL	DIFFERENCE	PERCENTAGE DIFFERENCE
SSA	71 000	65 546	5 454	8,32
SSB	64 000	60 655	3 345	5,51
Std 1	58 700	58 078	622	1,07
2	46 300	46 742	- 442	- 0,95
L.P.	240 000	231 021	8 979	3,89
Std 3	42 700	41 751	949	2,27
4	35 800	35 095	705	2,01
5	33 000	30 320	2 680	8,83
H.P.	111 500	107 166	4 334	4,04
Form I	28 000	27 278	722	2,65
II	25 000	24 747	253	1,02
III	12 900	20 209	- 7 309	- 36,16
IV	3 750	3 619	131	3,62
V	1 850	1 945	- 95	- 4,88
Sec	71 500	77 798	- 6 298	- 8,10
TOTAL	423 000	415 985	7 015	1,69

4. FORECASTS OF PRIMARY AND SECONDARY SCHOOL ENROLMENT IN BOPHUTHATSWANA

4.1. The lower primary phase

The lower primary school phase in Bophuthatswana covers the

first four years of the formal school structure. The largest proportion of the total school population is accommodated in this school phase. The percentage of all the pupils involved in the lower primary phase is, however, showing a decrease. It might be said, therefore, that the school-going population in Bophuthatswana is attaching increasing importance or value to the other school phases. In the past more pupils dropped out of the school system before or on completion of the lower primary phase than is the case in more recent years. This trend can be expected to be maintained in the near future.

In 1969 more than 65 per cent of the primary and secondary school pupils were enrolled in lower primary classes. By 1975 this figure had dropped to 58,12 per cent and in 1978 to 55,54 per cent (Compare Table A.2). This, however, does not mean that actual enrolment is decreasing. There is still a steady annual increase in lower primary enrolment which could rise to approximately 275 000 by 1983.

Forecasts of enrolment for the lower primary phase were made for every standard individually and for the phase as a whole. The sum of the forecasts in the different standards in the lower primary phase was then compared with the forecast for the phase as a whole.

The linear curve and the parabola both correlated relatively well with the historical data. The estimates were based

on a weighted average between the parabola and the linear curve, after minor drops in enrolment in substandard A and substandard B for 1978 had been taken into account. In view of the mentioned influencing factors the forecasts were made as in Table 1.2 below:

TABLE 1.2. FORECASTS OF THE LOWER PRIMARY ENROLMENT ACCORDING TO STANDARD IN BOPHUTHATSWANA UNTIL 1983*

STANDARD YEAR	Sub A	Sub B	Standard 1	Standard 2	TOTAL
1978**	65 546	60 655	58 078	46 742	231 021
1979	67 000	62 000	60 000	49 000	238 000
1980	69 000	64 000	61 500	50 500	245 000
1981	72 000	66 000	63 500	52 500	254 000
1982	75 000	69 000	65 500	55 000	264 500
1983	78 000	72 000	68 000	57 000	275 000

*Compare Table A.1 and Figures B.1 to B.5

**Unpublished actual enrolment supplied by the Department of Education in Bophuthatswana

4.2. The higher primary phase

Until and including 1975 the higher primary phase included standard 3 to standard 6. At the end of 1975 standard 6 was removed from the school structure and the higher primary phase. Since 1976 the higher primary phase has extended from standard 3 to standard 5.

The percentage of the total primary and secondary school population that was enrolled in the higher primary phase decreased marginally from 1969 to 1975. In 1969 just more than 33 per cent of all primary and secondary school pupils were in higher primary classes. By 1975 the figure had decreased to 31,38 per cent. Understandably fewer pupils have been involved in this school phase since 1976 when standard 6 fell away. Higher primary enrolment for 1978 stood at 107 166 (25,76 per cent of the total enrolment) as compared to 111 596 in 1975 when standard 6 still formed part of the structure (Compare Table A.2).

The forecasts for the different standards were made according to the parabola which indicated a tendency towards an ease in the rate at which enrolment was increasing. An adjustment in the estimate of standard 5 enrolment had to be made because of a drop in enrolment in 1977. The forecast for the higher primary phase as a whole was made according to the parabola.

Table 1.3 gives the complete picture with regard to the forecasts until 1983:

TABLE 1.3. FORECASTS OF THE HIGHER PRIMARY ENROLMENT ACCORDING TO STANDARD IN BOPHUTHATSWANA UNTIL 1983*

STANDARD YEAR	Standard 3	Standard 4	Standard 5	TOTAL
1978**	41 751	35 095	30 320	107 166
1979	43 500	36 500	31 000	111 000
1980	45 000	38 000	32 000	115 000
1981	46 500	39 500	34 000	120 000
1982	48 000	40 500	35 500	124 000
1983	49 000	41 500	37 500	128 000

*Compare Table A.1 and Figures B.6 to B.9

**Unpublished actual enrolment supplied by the Department of Education in Bophuthatswana

4.3. The secondary phase

The secondary school phase extends from form I to form V. The fast growing demand for secondary education in Bophuthatswana is reflected in the explosion of pupil-numbers in this phase. Although a smaller proportion of pupils attend secondary schools as compared to other school phases, the growth in enrolment is by far the largest in this sector of the educational system. As a result great stress is being put on the Department of Education to supply educational opportunities to pupils

demanding secondary education.

Since 1969 when 12 328 or 5,41 per cent of the primary and secondary school population were enrolled in secondary classes, enrolment in the secondary phase has increased the 1969 figure more than six times to 77 798 in 1978. The secondary school enrolment for 1978 is 18,70 per cent of the total enrolment (Compare Table A.2). Two factors can be distinguished as determining in this sharp increase in enrolment

i. Standard 6 was removed from the system at the end of 1975. The result of this was that pupils of both standard 5 and standard 6 who were successful in obtaining passes and wished to continue their secondary studies, had to be accommodated in form I in 1976. This created a wave effect that is moving through the whole secondary school phase and should have an effect on form V enrolment in 1980.

ii. The demand for secondary education by individuals is increasing. In the past pupils were mostly contented with some form of primary school qualifi= cation. That situation has changed to a great extent and more and more pupils are demanding an opportunity to obtain secondary school qualifications.

Great pressure regarding the supply of secondary education to provide in the present need already exists, and the picture for the future does not indicate any signs of relief in this respect. According to the forecasts secondary school enrolment will continue at the present rate, at least for the short term.

The estimates of enrolment were made according to the parabola. An adjustment was necessary with regard to form IV enrolment for 1979 and form V enrolment for 1980, because provision had to be made for the mentioned wave effect. After taking the above consideration into account, the forecasts were made as indicated in Table 1.4.

TABLE 1.4. FORECASTS OF SECONDARY ENROLMENT ACCORDING TO STANDARD IN BOPHUTHATSWANA UNTIL 1983*

STANDARD YEAR	Form I	Form II	Form III	Form IV	Form V	TOTAL
1978**	27 278	24 747	20 209	3 619	1 945	77 798
1979	29 000	27 000	20 000	9 000	3 000	88 000
1980	31 000	28 500	22 500	10 000	5 000	97 000
1981	34 000	30 500	25 000	11 000	6 000	106 500
1982	37 000	33 000	28 000	13 000	7 000	118 000
1983	41 000	36 000	31 000	16 000	9 000	133 000

* Compare Table A.1 and Figures B.10 to B.15
** Unpublished actual enrolment supplied by the Department of Education in Bophuthatswana

4.4. Total primary and secondary enrolment

In 1969 there were 227 911 pupils enrolled in primary and secondary schools in Bophuthatswana. Since 1969 the Department of Education has expanded its activities considerably and in 1978 education was provided to 415 985 primary and secondary pupils. If the present rate of increase in enrolment is going to be maintained, enrolment could rise to more than 500 000 by 1982.

The historical data correlated well with both the linear curve and the parabola. Table 1.5. shows the forecasts for total primary and secondary enrolment until 1983.

TABLE 1.5.: FORECASTS OF THE PRIMARY AND SECONDARY ENROLMENT ACCORDING TO STANDARD IN BOPHUTHATSWANA UNTIL 1983*

SCHOOL PHASE YEAR	LOWER PRIMARY	HIGHER PRIMARY	SECONDARY	TOTAL
1978**	231 021	107 166	77 798	415 985
1979	238 000	111 000	88 000	437 000
1980	245 000	115 000	97 000	457 000
1981	254 000	120 000	106 500	480 500
1982	264 500	124 000	118 000	506 500
1983	275 000	128 000	133 000	536 000

* Compare Table A.1 and Figures B.5, B.9, B.15 and B.16
**Unpublished actual enrolment supplied by the Department of Education in Bophuthatswana

5. A FEW IMPLICATIONS OF THE ENROLMENT INCREASE

5.1. Number of teachers needed 1979 - 1983

According to unpublished information supplied by the Department of Education of Bophuthatswana the total pupil enrolment for 1978 stands at 418 942. If this is seen in relation to the total number of teachers in Bophuthatswana in 1978, namely 7 883 it means that the pupil-teacher-ration for 1978 comes to 53:1. This corresponds with the total pupil-teacher-ratio for 1977 which is shown in Table 1.6.

TABLE 1.6. : PUPIL-TEACHER-RATIO FOR DIFFERENT SCHOOL PHASES IN BOPHUTHATSWANA, 1977

SCHOOL PHASE	ENROLMENT	NUMBER OF TEACHERS	PUPILS PER TEACHER
Lower primary	230 305	3 086	75
Higher primary	105 274	2 520	42
Total primary	335 579	5 606	60
Secondary and teacher training	67 741	1 892	36
Sub total	403 320	7 498	54
Others	1 643	109	15
Total	404 963	7 607	53

Source: Brazelle, 1978b, p. 137.

In order to maintain the pupil-teacher-ratio in the primary and secondary shool phases, should the enrolment continue to

increase as indicated in Table A.1, the number of teachers required for each school phase up to 1983 will be as shown in Table 1.7.

TABLE 1.7.: NUMBER OF TEACHERS REQUIRED IN PRIMARY AND SECONDARY SCHOOL PHASES IN BOPHUTHATSWANA, 1979-1983

SCHOOL PHASE AND YEAR	ENROLMENT	PUPIL-TEACHER RATIO	NUMBER OF TEACHERS REQUIRED
1979: Lower primary	238 000	75	3 173
Higher primary	111 000	42	2 643
Primary	349 000	--	5 816
Secondary	88 000	36	2 444
Total	437 000	--	8 260
1980: Lower primary	245 000	75	3 267
Higher primary	115 000	42	2 738
Primary	360 000	--	6 005
Secondary	97 000	36	2 694
Total	457 000	--	8 699
1981: Lower primary	254 000	75	3 387
Higher primary	120 000	42	2 857
Primary	374 000	--	6 244
Secondary	106 500	36	2 958
Total	480 500	--	9 202
1982: Lower primary	264 500	75	3 527
Higher primary	124 000	42	2 952
Primary	388 500	--	6 479
Secondary	118 000	36	3 278
Total	506 500	--	9 757
1983: Lower primary	275 000	75	3 667
Higher primary	128 000	42	3 043
Primary	403 000	--	6 715
Secondary	133 000	36	3 694
Total	536 000	--	10 409

The number of new teachers who ought to enter the teaching profession each year in order to meet the needs stated above, is further increased by the normal annual loss of teachers, for instance through retirement, acception of posts outside Bophuthatswana and resignation. Investigation showed that time and again only an average 90 per cent of the previous year's teachers is available for the next year (Brazelle, 1978b, p. 138). If this fact is brought into relation to the number of teachers required annually up to 1983 (Table 1.7.), Table 1.8. shows the additional number of teachers annually required for the different school phases in Bophuthatswana up to 1983.

Further assimilation of the data in Table 1.8. shows that the average number of new teachers who should annually enter the teaching profession in order to meet the expected needs, is as follows:

Primary teachers	781
Secondary teachers	609
Total	1 390

This average annual requirement for new teachers compares as follows with the number of successful students who completed their studies at the teachers training colleges in Bophuthatswana during December 1977.

TABLE 1.8 : NUMBER OF ADDITIONAL TEACHERS ANNUALLY REQUIRED FOR DIFFERENT SCHOOL PHASES IN BOPHUTHATSWANA UP TO 1983

SCHOOL PHASE AND DATE	NUMBER OF TEACHERS REQUIRED	AVAILABLE: 90% OF PREVIOUS YEAR	ADDITIONALLY REQUIRED
1979: Lower primary	3 173	90% of 3 200* = 2 880	293
Higher primary	2 543	90% of 2 655* = 2 390	253
Primary	5 816	90% of 5 855* = 5 270	546
Secondary	2 444	90% of 1 986* = 1 787	657
Total	8 260	90% of 7 841* = 7 057	1 203
1980: Lower primary	3 267	90% of 3 173 = 2 855	412
Higher primary	2 738	90% of 2 643 = 2 379	359
Primary	6 005	90% of 5 816 = 5 234	771
Secondary	2 694	90% of 2 444 = 2 200	494
Total	8 699	90% of 8 260 = 7 434	1 265
1981: Lower primary	3 387	90% of 3 267 = 2 940	447
Higher primary	2 857	90% of 2 738 = 2 464	393
Primary	6 244	90% of 6 005 = 5 404	840
Secondary	2 958	90% of 2 694 = 2 425	533
Total	9 202	90% of 8 699 = 7 829	1 373
1982: Lower primary	3 527	90% of 3 387 = 3 048	479
Higher primary	2 952	90% of 2 857 = 2 571	381
Primary	6 479	90% of 6 244 = 5 619	860
Secondary	3 278	90% of 2 958 = 2 662	616
Total	9 757	90% of 9 202 = 8 281	1 476
1983: Lower primary	3 667	90% of 3 527 = 3 174	493
Higher primary	3 048	90% of 2 952 = 2 657	391
Primary	6 715	90% of 6 479 = 5 831	884
Secondary	3 694	90% of 3 278 = 2 950	744
Total	10 409	90% of 9 757 = 8 781	1 628

*Brazelle, 1978b, p.139

	Primary	Secondary	Total
Provision of new teachers' by training colleges, December 1977*	1 250	92	1 342
Average annual requirement for new teachers up to 1983	781	609	1 390

(* Brazelle, 1978a, p.38)

When interpreting the above comparison it should further be taken into account that the 92 successful secondary teacher students only obtained the Junior Secondary Teachers' Certificate. Training of senior secondary teachers in Bophuthatswana only commenced during 1978 with the establishment of the Senior Secondary Teachers' Certificate at Hebron Training College. According to unpublished data supplied by the Department of Education of Bophuthatswana the enrolment for this course amounted to 18 students during 1978.

After all the facts stated above have been taken into account the following conclusions may be reached:

- If the number of primary teachers who after completion of their training accept posts outside Bophuthatswana can be limited, the present teachers' training colleges in Bophuthatswana can provide enough teachers for the primary school phase in the immediate future so as to substantially improve the pupil-teacher-ratio for this phase.
- The current quantity as well as quality of teacher training for the secondary school phase is totally inadequate for the immediate future.

The general need for better trained teachers is further emphasized by the fact that 1 055 of the total number of teachers of 7 616 for 1977 were professionally unqualified, i.e. 13.85 per cent unqualified teachers (Brazelle, 1978a, p.12). Of the total number of teachers of 7 616 for 1977, 5 917 or 75,09 per cent only held a Junior Certificate or even lower qualifications (Brazelle, 1978a, p. 11).

If the preceding discussion is taken into account, priority should be given to the following matters in the future planning of teacher training in Bophuthatswana:

- The training of teachers for the secondary school phase: The extension of the training of senior secondary teachers which has commenced in 1978 is urgently necessary in order to increase both the quantity and the quality of secondary teachers. The scope of the course ought to be enlarged in order to include a wide choice of subjects so as to be able to provide teachers for the so called "scarce" subjects for instance mathematics, physical science and chemistry.
- In order to meet the demand for more and better qualified teachers in the immediate future, the in-service training of teachers ought to be extended. Courses for in-service training ought to be especially aimed at improving academic subject knowledge and methodology, as well as at acquiring professional qualifications.
- The largest demand for teachers at primary level is that in the lower primary school phase where the pupil-teacher-ratio

was 75:1 in 1977 as opposed to a ratio of 42:1 in the higher primary phase (see Table 1.6). In future, teacher training for primary level ought therefore to concentrate on the lower primary phase and the establishment of a specialised lower primary training-course ought to be considered.

- The current shortage of teachers and the financial implications implicit in the extension of training facilities, necessitate optimum utilisation of the already existing training facilities.

5.2. Number of classrooms needed towards 1983

The average number of pupils per classroom has remained constant at 62 during the past 9 years (Brazelle, 1978a, p.25). In order to maintain this situation until 1983, if the pupil enrolment increases as indicated in the forecasts, the number of classrooms annually required to accommodate the primary and secondary pupils, will have to be as follows:

1979:	Total primary and secondary enrolment	437 000
	Number of pupils per classroom	62
	Number of classrooms required	7 049
1980:	Total primary and secondary enrolment	457 000
	Number of pupils per classroom	62
	Number of classrooms required	7 371
1981:	Total primary and secondary enrolment	480 500
	Number of pupils per classroom	62
	Number of classrooms required	7 750

1982:	Total primary and secondary enrolment	506 500
	Number of pupils per classroom	62
	Number of classrooms required	8 170
1983:	Total primary and secondary enrolment	536 000
	Number of pupils per classroom	62
	Number of classrooms required	8 646

When the above is compared with the number of classrooms available in 1977, namely 6 658, it appears that 1988 (29,86 per cent) additional classrooms will have to be made available towards 1983 in order to maintain the current situation. If the current situation of 62 pupils per classroom has to be improved by 1983, the number of classrooms required for different classroom-pupil-ratios is shown in Table 1.9.

TABLE 1.9.: NUMBER OF CLASSROOMS REQUIRED FOR DIFFERENT CLASSROOM-PUPIL-RATIOS IN BOPHUTHATSWANA in 1983.

PRIMARY AND SECONDARY ENROLMENT	CLASSROOM-PUPIL-RATIO	NUMBER OF CLASSROOMS REQUIRED
536 000	60	8 934
536 000	55	9 746
536 000	50	10 720
536 000	45	11 911
536 000	40	13 400

If the number of classrooms required in 1983 for different classroom-pupil-ratios is compared with the total number of classrooms in 1977, namely 6 658, the additional numbers of classrooms which will have to be in use in 1983 are shown in Table 1.10.

TABLE 1.10 : ADDITIONAL CLASSROOMS FOR PRIMARY AND SECONDARY PUPILS IN BOPHUTHATSWANA BY 1983 FOR DIFFERENT CLASSROOM-PUPIL-RATIOS

CLASSROOM-PUPIL-RATIO	EXISTING CLASS=ROOMS 1977	CLASSROOMS REQUIRED 1983	ADDITIONAL CLASS ROOMS REQUIRED 1983
1:62 (current)	6 658	8 646	1 988
1:60	6 658	8 934	2 276
1:55	6 658	9 746	3 088
1:50	6 658	10 720	4 062
1:45	6 658	11 911	5 253
1:40	6 658	13 400	6 742

In order to prevent the provision of classrooms not keeping pace with the increase in pupil enrolment, the first priority will therefore have to be that the current classroom-pupil-ratio of 1:62 should be at least maintained until 1983. That means that 1 988 additional classrooms will have to be built up to 1983, i.e. an average of 332 annually. After this first objective has been realised each year, as many as possible additional classrooms may be built in order to reach the long=

term objective of 40 pupils per classroom stated by the Secretary of Education in 1972 (Bophuthatswana, 1973, p.21).

5.3. Projected government expenditure on primary and secondary education up to 1983/84.

Between 1969 and 1976 the estimated expenditure per pupil (all kinds of education) in Bophuthatswana has increased from R13,16 to R46,96 (Brazelle, 1978a, p.34). This represents an average annual increase of 20,65 per cent in the cost per pupil. In 1978 the cost per pupil has increased to R48,38*. Assuming that the system of financing up to 1983/84 will rest on the current system, Table 1.11 shows the estimated cost regarding primary and secondary education (capital outlay excluded) up to 1983/84 under the following circumstances:

(i) If the 1978/79 annual cost per pupil (R48,38) is maintained in real terms - an inflation rate of 10 per cent per year is accepted, and

(ii) if the cost per pupil per year increases at the average rate of the period 1969 - 1976, namely ± 20 per cent.

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* Assimilated from Bophuthatswana's estimates of revenue and expenditure for the year ending 31 March 1979, and un= published pupil enrolment supplied by the Department of Education of Bophuthatswana.

TABLE 1.11 : ESTIMATED CURRENT GOVERNMENT EXPENDITURE ON PRIMARY AND SECONDARY EDUCATION IN BOPHUTHA=TSWANA UP TO 1983 CALCULATED FROM THE COST PER PUPIL

YEARS	PUPILS	COST PER PUPIL		ESTIMATED EXPENDITURE	
		Real R48,38 p.a.	Annual increase of 20%	Real R48,38 per pupil	20% increase in cost per pupil
1978/79	415 985	R48,38	R48,38	R20,27M *	R20,27M *
1979/80	437 000	53,22	58,06	23,26	25,37
1980/81	457 000	58,54	69,67	26,75	31,84
1981/82	480 500	64,39	83,60	30,94	40,17
1982/83	506 500	70,83	100,32	35,88	50,81
1983/84	536 000	77,91	120,38	41,76	64,52

* Bophuthatswana, Estimates of revenue and expenditure for the year ending 31 March 1979, p. 38.

In order to maintain the 1978 cost per pupil the estimated current expenditure on primary and secondary education will therefore increase to R41,76 m in 1983. This represents an increase of 103,52 per cent on the expenditure of 1978/79. In order to maintain the average annual increase of 20 per cent in the cost per pupil up to 1983, this will mean that the estimated current expenditure on primary and secondary education will have to increase to R64,52 in 1983. This represents an increase of 218,30 per cent on the expenditure of 1978/79.

6. CLOSING REMARKS

In this report the expected increase in pupil enrolment in

Bophuthatswana up to 1983 has been indicated by means of scientific forecasts. The implications of the expected increase in pupil enrolment for the provision of teachers and classrooms, as well as the increase in government ex= penditure on primary and secondary education which will be necessitated by the increase in pupil enrolment, has been indicated.

The increase in pupil enrolment and the expected implications thereof on the demand for teachers, classrooms and government expenditure, however, are only a few of the aspects which will have to be cleared by the educational planners in their scientific planning of a system of education. Therefore these aspects ought not to be regarded as separate from the total educational system planning of Bophuthatswana. The educational planning of Bophuthatswana in its turn ought to form an integral part of the general development plans of the country for the general development of the nation.

APPENDIX A

TABLE A.1: ENROLMENT IN BOPHUTHATSWANA FROM 1969 TO 1978 ACCORDING TO STANDARD WITH FORECASTS TO 1983

STANDARD / YEAR	Sub A	Sub B	Standard 1	Standard 2	Lower Primary	Standard 3	Standard 4	Standard 5	Standard 6	Higher Primary	Form I	Form II	Form III	Form IV	Form V	Secondary	TOTAL
1969	44547	39050	36184	28636	148417	23000	17309	14110	12747	67166	5045	3978	2617	437	251	12328	227911
1970	46870	41835	39908	30952	159565	26240	19626	15911	15293	77070	5483	4520	3093	652	307	14055	250690
1971	49567	43704	41923	33194	168388	28894	21613	17578	16814	84899	6224	5062	3889	798	431	16404	269691
1972	52123	46448	44289	34226	177086	31224	24139	19506	18843	93712	7437	5910	4112	1117	480	19056	289854
1973	53675	49043	46974	36425	186117	32824	26678	21871	21337	102710	8778	6787	4845	1283	653	22346	311173
1974	56075	50766	48942	38617	194400	34347	27825	23882	23073	109127	10694	7914	5529	1632	791	26560	330087
1975	62155	52861	51385	40308	206709	36681	30155	24740	20020	111596	18007	9782	6601	1925	1026	37341	355646
1976	66831	58739	53811	43388	222769	39154	32300	32603	-*	104057	29728	14282	7855	2755	1275	55895	382721
1977	67672	60848	57232	44553	230305	41371	33609	30294	-	105274	25935	22954	11075	3129	1557	64650	400229
1978	65546	60655	58078	46742	231021	41751	35095	30320	-	107166	27278	24747	20209	3619	1945	77798	415985
1979	67000	62000	60000	49000	238000	43500	36500	31000	-	111000	29000	27000	20000	9000	3000	88000	437000
1980	69000	64000	61500	50500	245000	45000	38000	32000	-	115000	31000	28500	22500	10000	5000	97000	457000
1981	72000	66000	63500	52500	254000	46500	39500	34000	-	120000	34000	30500	25000	11000	6000	106500	480500
1982	75000	69000	65500	55000	264500	48000	40500	35500	-	124000	37000	33000	28000	13000	7000	118000	506500
1983	78000	72000	68000	57000	275000	49000	41500	37500	-	128000	41000	36000	31000	16000	9000	133000	536000

SOURCE: FIGURES FOR 1969 TO 1977 FROM DEPARTMENT OF BANTU EDUCATION ANNUAL REPORTS;
FIGURES FOR 1978 UNPUBLISHED DATA FROM BOPHUTHATSWANA DEPARTMENT OF EDUCATION

*STANDARD 6 WAS ELIMINATED AT THE END OF 1975

TABLE A.2: PERCENTAGE DISTRIBUTION OF PRIMARY AND SECONDARY ENROLMENT IN BOPHUTHATSWANA FROM 1969 TO 1978 WITH FORECASTS TO 1983

STANDARD YEAR	SUB A	SUB B	STANDARD 1	STANDARD 2	LOWER PRIMARY	STANDARD 3	STANDARD 4	STANDARD 5	STANDARD 6	HIGHER PRIMARY	FORM I	FORM II	FORM III	FORM IV	FORM V	SECONDARY	TOTAL
1969	19,55	17,13	15,88	12,56	65,12	10,09	7,60	6,19	5,59	29,47	2,21	1,75	1,15	0,19	0,11	5,41	100,00
1970	18,70	16,68	15,92	12,35	63,65	10,46	7,83	6,35	6,10	30,74	2,19	1,81	1,23	0,26	0,12	5,61	100,00
1971	18,38	16,21	15,54	12,31	62,44	10,72	8,01	6,52	6,23	31,48	2,31	1,87	1,44	0,30	0,16	6,08	100,00
1972	17,98	16,02	15,28	11,81	61,09	10,77	8,33	6,73	6,50	32,33	2,56	2,04	1,42	0,39	0,17	6,58	100,00
1973	17,25	15,76	15,09	11,71	59,81	10,55	8,57	7,03	6,86	33,01	2,82	2,18	1,56	0,41	0,21	7,18	100,00
1974	16,98	15,38	14,83	11,70	58,89	10,41	8,43	7,23	6,99	33,06	3,24	2,40	1,68	0,49	0,24	8,05	100,00
1975	17,48	14,86	14,45	11,33	58,12	10,31	8,48	6,96	5,63	31,38	5,06	2,75	1,86	0,54	0,29	10,50	100,00
1976	17,46	15,35	14,06	11,34	58,21	10,23	8,44	8,52	-*	27,19	7,77	3,73	2,05	0,72	0,33	14,60	100,00
1977	16,91	15,20	14,30	11,13	57,54	10,34	8,40	7,57	-	26,31	6,48	5,73	2,77	0,78	0,39	16,15	100,00
1978	15,76	14,58	13,96	11,24	55,54	10,04	8,43	7,29	-	25,76	6,56	5,95	4,86	0,87	0,46	18,70	100,00
1979	15,33	14,18	13,73	11,22	54,46	9,95	8,36	7,09	-	25,40	6,64	6,18	4,58	2,06	0,68	20,14	100,00
1980	15,10	14,00	13,46	11,05	53,61	9,85	8,32	7,00	-	25,17	6,78	6,24	4,92	2,19	1,09	21,22	100,00
1981	14,98	13,74	13,21	10,93	52,86	9,67	8,22	7,08	-	24,97	7,08	6,35	5,20	2,29	1,25	22,17	100,00
1982	14,81	13,62	12,93	10,86	52,22	9,47	8,00	7,01	-	24,48	7,31	6,51	5,53	2,57	1,38	23,30	100,00
1983	14,55	13,43	12,69	10,64	51,31	9,14	7,74	7,00	-	23,88	7,65	6,72	5,78	2,98	1,68	24,81	100,00

SOURCE: CALCULATIONS BASED ON FIGURES IN TABLE A.1

*STANDARD 6 WAS ELIMINATED AT THE END OF 1975

APPENDIX B DELETED BY CLEARINGHOUSE DUE TO ILLEGIBILITY

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